Amendments to the Claims

The listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Currently Amended) An optical system, comprising:

a lens to refract light radiating from an object;

an image producing surface on which an image corresponding to the object is produced according to the light refracted by the lens; and

an image producing surface control unit to control the image producing surface to move with respect to the lens, the image producing surface control unit comprising an angle control unit located at a position spaced apart from an optical axis of the lens to control an angle between the optical axis of the lens and the image producing surface.

2. (Cancelled)

3. (Original) The optical system according to claim 2, further comprising:

a base to which the lens is mounted, and having a rotative shaft; and

a body to which the image producing surface is mounted, the body coupled to the base by the rotative shaft to rotate relative to the base.

4. (Original) The optical system according to claim 3, wherein a central axis of the rotative shaft and the image producing surface are placed on the same plane.

5. (Original) The optical system according to claim 3, wherein the image producing surface rotates with respect to the same plane as the rotative shaft.

6. (Original) The optical system according to claim 5, wherein the body comprises:

an outer frame supported by the rotative shaft;

an inner frame mounted to the outer frame to rotate around a central axis of the outer frame; and

a rear casing mounted to the inner frame, the image producing surface mounted to the

rear casing.

7. (Original) The optical system according to claim 6, further comprising:

a charge-coupled device (CCD) provided on the image producing surface to convert the light radiating from the object into an electrical signal corresponding to at least one portion of the object.

8. (Original) The optical system according to claim 3, wherein the angle control unit comprises:

a distance adjusting unit provided at a position which is spaced apart from the rotative shaft.

9. (Original) The optical system according to claim 8, wherein the angle control unit further comprises:

an elastic member having a first end mounted to the base, and a second end mounted to the body.

10 (Original) The optical system according to claim 8, wherein the distance adjusting unit comprises:

a thimble to rotate around a central axis thereof;

a spindle to advance or retract according to a rotating direction of the thimble; and

a sleeve to support both the thimble and the spindle.

11. (Original) An inclined optical system, comprising:

a lens to refract light radiating from an object; and

an image producing surface on which an image is produced by the light refracted by the lens,

wherein an optical axis of the lens is disposed at a predetermined angle with the object, and wherein, when the optical axis is expressed by X, an intersection point between a first main surface of the lens, which faces the object, and the optical axis X is expressed by a first main

point O_1, and an intersection point between a second main surface of the lens, which faces the image producing surface, and the optical axis X is expressed by a second main point O_2, when a first point on the object is expressed by A, a foot of the first point A perpendicular to the optical axis X is expressed by A_0, a distance between the foot A_o and the first main point O_1 is expressed by s_2, an image of the first point A produced on the image producing surface is expressed by A', a foot of the image A' perpendicular to the optical axis X is expressed by A'_0, and a distance between the foot A'_0 and the second main point O_2 is expressed by s'_2, and when a second point on the object is expressed by C, a foot of the second point C perpendicular to the optical axis X is expressed by C_0, a distance between the foot C_o and the first main point O_1 is expressed by s_3, an image of the second point C produced on the image producing surface is expressed by C', a foot of the image C' perpendicular to the optical axis X is expressed by C'_0, and a distance between the foot C'_0 and the second main point O_2 is expressed by s'_3, the image producing surface is inclined relative to the optical axis X of the lens so that the distance s'_2 is shorter than the distance s'_3 when the distance s_2 is longer than the distance s_3.

12. (Original) The inclined optical system according to claim 11, wherein, when the first point A is set so that the distance s_2 between the foot A_0 and the first main point O_1 is a predetermined distance, and when a focal distance of the lens is expressed by f, an intersection point between the object and the optical axis X of the lens is expressed by B, a distance between the intersection point B and the first main point O_1 is expressed by s_1, an image of the intersection point B produced on the image producing surface is expressed by B', and a distance between the image B' and the second main point O_2 is expressed by s'_1, the image producing surface is inclined relative to the optical axis X of the lens to satisfy both the following Equations:

$1/s_1 + 1/s'_1 = 1/f$ and $1/s_2 + 1/s'_2 = 1/f$.

13. (Original) The inclined optical system according to claim 12, wherein, when the second point C is set so that the distance s_3 between the foot C_0 and the first main point O_1 is another predetermined distance, the image producing surface is inclined relative to the optical axis X of the lens to satisfy the following Equation:

$1/s_3 + 1/s'_3 = 1/f$.

14. (Original) The inclined optical system according to claim 11, wherein, when the second point C is set so that the distance s_3 between the foot C_0 and the first main point O_1 is a predetermined distance, and when a focal distance of the lens is expressed by f, an intersection point between the object and the optical axis X of the lens is expressed by B, a distance between the intersection point B and the first main point O_1 is expressed by s_1, an image of the intersection point B produced on the image producing surface is expressed by B', and a distance between the image B' and the second main point O_2 is expressed by s'_1, the image producing surface is inclined relative to the optical axis X of the lens to satisfy both the following Equations:

$1/s_1 + 1/s'_1 = 1/f$ and $1/s_3 + 1/s'_3 = 1/f$.

15. (Original) The inclined optical system according to claim 11, wherein, when an intersection point between the first main surface and a line extending through the first point A and the second point C is expressed by D, and an intersection point between the second main surface and a line extending through the image A' and the image C' is expressed by E, the image producing surface is inclined relative to the optical axis X of the lens so that a line extending through the intersection point D and the intersection point E is parallel to the optical axis X.

16. (Currently Amended) An optical system, comprising:

a lens to refract light radiating from an object; ~~and~~

an image producing surface on which an image is produced according to the light refracted by the lens, the lens and the image producing surface inclined in opposite directions relative to an optical axis of the lens;

a base on which the lens is mounted;

a body on which the image producing surface is mounted;

an angle control unit mounted to the body to push the base with respect to the body to

control an angle between the optical axis of the lens and the image producing surface; and

an elastic member to bias the body towards the base.

17. (Original) The optical system according to claim 16, wherein the image producing surface is movably disposed to be inclined with respect to a line perpendicular to the optical axis of the lens.

18. (Original) The optical system according to claim 16, wherein the lens is disposed on a first plane perpendicular to the optical axis of the lens, and the image producing surface is inclined with respect to the first plane of the lens.

19. (Original) The optical system according to claim 18, wherein the object is disposed on a second plane inclined with respect to the optical axis of the lens.

20. (Original) The optical system according to claim 16, wherein the object comprises first and second portions disposed opposite to each other with respect to the optical axis of the lens, and the image producing surface moves with respect to the lens so that the image corresponding to the first and second portions of the object is clearly obtained on the image producing surface.

21. (Original) The optical system according to claim 16, wherein the object comprises a first and second portions, the image comprises a first sub-image and a second sub-image corresponding to first and second portions of the object, respectively, and the image producing surface is inclined relative to the optical axis of the lens so that a distance from the lens to the first sub-image is shorter than a distance from the lens to the second sub-image when a distance from the lens to the first portion of the object is longer than a distance from the lens to the second portion of the object.

22. (Original) The optical system according to claim 21, wherein the image producing surface is inclined relative to the optical axis of the lens to satisfy that an inverse

number of a focal distance of the lens is equal to both a first sum of an inverse number of a distance from the lens to an intersection between the optical axis and the object and an inverse number of a distance from the lens to an intersection between the optical axis and the image, and a second sum of an inverse number of the distance from the lens to the first portion of the object and an inverse number of the distance from the lens to the first sub-image.

23. (Original) The optical system according to claim 22, wherein the inverse number of the focal distance of the lens is equal to a sum of an inverse number of the distance from the lens to the second portion of the object and an inverse number of the distance from the lens to the second sub-image.

24. (Original) The optical system according to claim 21, wherein the first portion of the object is disposed opposite to the first sub-image with respect to the optical axis of the lens, and the second portion of the object is disposed opposite to the second sub-image with respect to the optical axis of the lens.

25. (Original) The optical system according to claim 16, further comprising:

a base on which the lens is mounted;

at least one shaft formed on the base;

a frame on which the image producing surface is mounted, the frame having at least one shift mounting hole to receive the at least one shaft; and

an image producing surface control unit to move the frame with respect to the base.

26. (Original) The optical system according to claim 25, wherein the base comprises a portion extending toward the frame in a direction parallel to the optical axis of the lens, and the at least one shaft is formed on the portion of the base in a direction substantially perpendicular to the optical axis of the lens to be inserted into the at least one shaft mounting hole.

27. (Currently Amended) The optical system according to claim 26, wherein the image producing surface control unit comprises a distance adjusting unit disposed on a portion

of the frame other than the at least one shaft mounting hole, and the distance adjusting unit ~~comprisies~~ comprises a spindle advancing and retracting with respect to the frame to move the frame toward and away from the base with respect to the at least one shaft.

28. (New) An optical system, comprising:

a base having a lens to refract light radiating from an object;

a body having an image producing surface on which an image of the object is produced according to the light refracted by the lens; and

an angle control unit disposed on a first end of the body to control an angle between the lens and the image producing surface with respect to a second end of the body disposed opposite to the first end with respect to the image producing surface.